

# PATENT ABSTRACTS OF JAPAN

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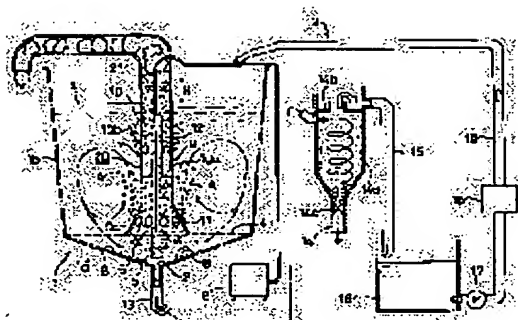
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## (54) FISH-FARMING INSTALLATION

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To obtain the subject fish-farming installation that can readily remove foreign substances accumulating to the bottom of the water tank and organic substances dissolving in water by equipping the water tank with a bubble generator, further inclining the bottom of the tank and opening the outlet at the lowermost part.

**SOLUTION:** The water tank 1 is provided with a bubble generator 5, the bottom 1a of the tank 1 is inclined and the water outlet 2 is opened at the lowermost part in the tank 1. A bubble generator 5 is arranged near the water inlet, a pipe 7 is arranged near the bubble generator so that the bottom end of the pipe may open near the bubble generator 5, while the top end is extended over the water level. Further, through-holes 11, 12 may be bored at the submerge part of the pipe 7, the water-taking inlet 2 is communicated with the water circulator 3 and a centrifugal separator for removing foreign substance can be installed between the circulation pump 17 and the inlet 2.



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JAPANESE

[JP,10-57131,A]

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF  
THE INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF  
DRAWINGS DRAWINGS

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[Translation done.]

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CLAIMS

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[Claim(s)]

[Claim 1] Culture equipment for fish characterized by having made the bottom of a tank incline and carrying out opening of the intake to the lowest part of this tank while air bubbles arrange a blow-off \*\*\*\*\* member in a tank.

[Claim 2] Culture equipment for fish with which upper limit is characterized by having arranged the barrel which extends up and carrying out opening of the through hole to the submersion part of this barrel from the water surface in the culture equipment for fish according to claim 1 while a gassing member is arranged near the intake and a lower limit carries out opening above this gassing member near the gassing member.

[Claim 3] Culture equipment for fish characterized by having made the intake open water cycle equipment for free passage and infixing the centrifugal separator for tailing between the circulating pump of this water cycle equipment, and said intake in the culture equipment for fish according to claim 1 or 2.

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JAPANESE

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the culture equipment for fish which cultivates a fish within a tank.

[0002]

[Description of the Prior Art] The tank used in order to cultivate a fish ashore conventionally forms the bottom in an abbreviation horizontal, in order to stop an overall height low. Moreover, this kind of tank has connected the water cycle equipment of the structure which supplies the water which filtered to the filter the water attracted from the bottom with through and this filter from the upper part. Said filter is for removing harmful matter, such as ammonia.

[0003]

[Problem(s) to be Solved by the Invention] However, there was a problem that a bottom will be covered with the foreign matter which becomes that the bottom of a tank is an abbreviation horizontal as mentioned above from a part for the remainder of food, the stools of a fish, etc. In the former, though it knows becoming a cost rise, a worker goes under cleaning of the bottom of a tank and it is performed.

[0004] Moreover, when the bottom of a tank is covered with many said foreign matters, this foreign matter is absorbed by water cycle equipment, and may accumulate on a circulating-pump side. If the water path of a circulating pump is narrowed with said deposit, the capacity to circulate water will decline. For this reason, the proposal of culture equipment which can collect said foreign matters easily is demanded.

[0005] Furthermore, it originates in a fish sailing within a tank, and since the organic substance, such as mucus of a penetration \*\*\*\*\* front face, is underwater unremovable with conventional culture equipment, all the water in a tank is exchanged for every fixed period. In addition, since it is easy to generate plugging while it is expensive, the filter for removing said organic substance cannot adopt this, in order to aim at a cost cut.

[0006] It was made in order that this invention might cancel such a trouble, and it aims at offering the culture equipment for fish which can remove the penetration \*\*\*\*\* organic substance easily in the foreign matter with which the bottom of a tank is covered, and water.

[0007]

[Means for Solving the Problem] In order to attain this purpose, the culture equipment for fish concerning this invention makes the bottom of a tank incline, and carries out opening of the intake to the lowest part of this tank while air bubbles arrange a blow-off \*\*\*\*\* member in a tank.

[0008] According to this invention, when blow-off \*\*\*\*\* goes up the inside of a tank from a gassing member, the water near the gassing member goes up with air bubbles. For this reason, the convection current of water occurs in a tank. Near the bottom of a tank, when this convection current arises, since water flows to a longitudinal direction, being pushed by water becomes a cause, as the foreign matters collected on the bottom of a

tank, such as a part for the remainder of food and stools of a fish, slide on an inclined plane, they get down from it, they move to the bottom of a tank, and go into an intake.

[0009] In the culture equipment for fish concerning invention mentioned above, the culture equipment for fish concerning other invention arranges a gassing member near the intake, arranges the barrel which a lower limit carries out opening near the gassing member, and extends more nearly up than the water surface above this gassing member, and carries out opening of the through hole to the submersion part of this barrel.

[0010] According to this invention, when the air bubbles which blew off from the inside of a barrel on the outside of a barrel through the through hole move upwards along with a barrel, the convection current of water occurs in a tank. Towards the lower part of a gassing member, i.e., the lowest part of the tank in which an intake carries out opening, when this convection current arises, water goes up along with a barrel and water flows from the side.

[0011] Moreover, when air bubbles go up the inside of a barrel, the organic substance, such as mucus on the front face of a fish, becomes a bubble, loses touch with the water surface in a barrel, and moves the inside of a barrel to the downstream with the pressure of air.

[0012] The culture equipment for fish concerning other invention infixes the centrifugal separator for tailing between an intake and the circulating pump of water cycle equipment in the culture equipment for fish concerning invention mentioned above. According to this invention, the foreign matter included in an intake is separated by the centrifugal separator with water, and the water which the foreign matter is not mixing flows into a circulating pump.

[0013]

[Embodiment of the Invention] Hereafter, drawing 1 explains the gestalt of 1 operation of the culture equipment for fish concerning this invention to a detail. Drawing 1 is the sectional view showing the configuration of the culture equipment for fish concerning this invention. In drawing 1, it is the tank which is shown with a sign 1. The water cycle equipment 3 later mentioned to the intake 2 which formed this tank 1 in the shape of a closed-end cylinder, and was formed in the center of a pars basilaris ossis occipitalis is made to open for free passage.

[0014] Bottom wall 1a of a tank 1 is made to incline so that it may become deep gradually as it goes to the central intake 2. Moreover, peripheral wall 1b prolonged upwards from the periphery of this bottom wall 1a is formed so that a bore may become large gradually, as it goes up. In order that a fish may prevent entering in an intake 2, the wire gauze 4 is attached in the part which connects peripheral wall 1b to said bottom wall 1a. This wire gauze 4 was formed so that it might see from the upper part and the whole region of bottom wall 1a might be covered, and it has attached the gassing member 5 in the upper part of an intake 2.

[0015] Said gassing member 5 takes the structure which blows off the air supplied from air hose 6 from many minute holes in a tank 1, and is arranging it near the upper part of an intake 2. Air hose 6 were extended above the tank 1 through the interior of the duct 7 arranged above the gassing member 5, and have connected the other end to the air delivery of an air pump 8.

[0016] Said duct 7 was constituted from a body 9 of a duct with a circular cross-section configuration, and a path formation member 10 which fixed inside this body 9 of a duct, was prolonged upwards in the core of the direction of a path of a tank 1 near the upper part of the gassing member 5, from the water surface L, it extended up, crossed the upper part of a tank 1, and is prolonged to the side of a tank 1. This duct 7 constitutes the barrel concerning this invention. Lower limit section 9a of said body 9 of a duct is formed in the configuration to which a bore becomes large gradually as it tends toward the shape of breadth, i.e., a lower part, at last so that the upper part around the gassing member 5 may be covered from the upper part. the lower round hole 11 formed so that this lower limit section 9a might penetrate a front flesh side -- spacing [ hoop direction / of lower limit

section 9a ] -- it is and more than one are formed.

[0017] Moreover, the up round hole 12 is formed in the part flooded with the water in the tank 1 in the body 9 of a duct above said lower round hole 11. the besides section round hole 12 -- the center of the vertical direction of a tank 1 -- small -- a top -- being located -- spacing [ hoop direction / of the body 9 of a duct ] -- it is and more than one are formed. Besides, the section round hole 12 and said lower round hole 11 constitute the through hole concerning this invention.

[0018] Said path formation member 10 was formed in the lower limit in the shape of [ which has circular ring-like flange 10a ] a cylinder, has fixed the periphery edge of this flange 10a to the inner skin of the body 9 of a duct over the perimeter, and is positioned on the same axis as the body 9 of a duct. The attaching position of the vertical direction of this path formation member 10 is set up so that the center section of the vertical direction of cylinder 10b may become the same height as said up round hole 12.

[0019] It is foreign matters which show what is shown with the sign A drawn in the tank 1 in drawing with air bubbles and Sign B, such as a part for the remainder of food, and stools of the fish which is not illustrated. In addition, this foreign matter B falls on bottom wall 1a of a tank 1 through the clearance between wire gauzes 4 within a tank 1.

[0020] Said water cycle equipment 3 is for performing water purification in a tank 1, and removal of said foreign matter B. The centrifugal separator 14 connected to the intake 2 through the intake pipe 13, and the flush tank 16 connected to this centrifugal separator 14 through the communicating tube 15, It constitutes from a filter 18 which removes the ammonia contained in the water supplied by the circulating pump 17 by bacteria from this flush tank 16, and a feed pipe 19 for returning the upper part to water from this filter 18 in a tank 1.

[0021] Said centrifugal separator 14 has taken the structure where only water overflows above dashboard 14b from the axial center section bottom while foreign matters B gather in the outside of the direction of a path according to a centrifugal force when a revolution style occurs as an arrow head shows to the interior of cylinder-like body 14a. With gravity, the foreign matter B brought together in the inner circumference section of said body 14a falls the inside of body 14a, and the bottom of body 14a is covered with it. Said intake pipe 13 which connects this centrifugal separator 14 and tank 1 has connected to the periphery part above dashboard 14b in body 14a the communicating tube 15 which connects with the periphery part below dashboard 14b in body 14a, and sends water to a flush tank 16 from a centrifugal separator 14.

[0022] In order to generate said revolution style with this centrifugal separator 14, with the gestalt of this operation, the centrifugal separator 14 has been arranged in the location lower than a tank 1, and the phenomenon in which water flows and gets down from a tank 1 to a centrifugal separator 14 is used. That is, said revolution style arises in body 14a by connecting an intake pipe 13 so that water may flow into said body 14a from a tangential direction. For this reason, the foreign matter B included in said intake 2 is pushed on the water which flows out of here, flows into a centrifugal separator 14, and is separated with water within a centrifugal separator 14. In addition, the foreign matter B which collected in the centrifugal separator 14 opens bulb 14c prepared in the bottom of a centrifugal separator 14, and discharges it below.

[0023] Thus, the constituted culture equipment for fish can remove the harmful matter (ammonia which the organic substance and the fish which a fish secretes excreted) contained in a foreign matter B and water by operating a circulating pump 17 while supplying air to the gassing member 5 in a tank 1 from an air pump 8. Here, why a foreign matter B and harmful matter are removable is explained to a detail.

[0024] When air is sent to the gassing member 5, air bubbles A are \*\*\*\*\* to underwater [ from the gassing member 5 ]. These air bubbles A enter inside lower limit section 9a of the shape of end breadth of the body 9 of a duct, and go up the inside of a duct 7. When air bubbles A enter in a duct 7, only the dimension which the water level in a duct 7 shows by H all over drawing rises.



[0025] Among the air bubbles A which entered inside said lower limit section 9a, as a part goes up the inside of lower limit section 9a, it goes into the lower round hole 11, and it blows off besides a duct 7 through this lower round hole 11. The remainder of air bubbles A goes up through the centrum of the path formation member 10. In the gestalt of this operation, since the structure where form the path formation member 10 in the middle of a duct 7, and the path in a duct 7 becomes narrow on the way is taken, the air bubbles A which went up said lower limit section 9a, without going into the lower round hole 11 come to pile up temporarily in the lower part of the path formation member 10. Going up more nearly up than it is controlled, it passes along the lower round hole 11, and the air bubbles A which joined this stagnation part from the lower part are \*\*\*\*\* besides a duct 7. That is, the air bubbles A of blow-off \*\*\*\*\* increase in number from the lower round hole 11.

[0026] A part goes into the condenser water box 20 between cylinder 10b of the path formation member 10, and body of duct 7a from the upper part, and it descends in this condenser water box 20, passes along the up round hole 12, and the air bubbles A which passed the centrum of the path formation member 10 and went up are \*\*\*\*\* besides a duct 7. The remaining air bubbles A go up to the water surface in a duct 7. Air bubbles A descend in said condenser water box 20 because the stream out of which only said dimension H is rising and the water level in a duct 7 flows out of a duct 7 through the up round hole 12 arises in a duct 7.

[0027] By blowing off from the lower round hole 11 and the up round hole 12, as air bubbles A mentioned above, and going up the inside of a tank 1, the water around a duct 7 comes to flow towards the upper part with air bubbles A, and the convection current occurs in a tank 1. A two-dot chain line shows the direction where the water by this convection current flows in drawing 1. That is, it goes up in the core of the direction of a path of a tank 1, and flows towards the outside of the direction of a path near the water surface, and after that, the water in a tank 1 descends along with peripheral wall 1b of a tank 1, it turns to the core of a tank 1 near the bottom wall 1a, and flows.

[0028] Thus, when the convection current arises, the foreign matter B which collected on bottom wall 1a of a tank 1 is pushed towards an intake 2 bywater, as it slides on the top face (inclined plane) of bottom wall 1a, it gets down to the bottom of a tank 1, and enters in an intake 2. Since the stream which faces to a centrifugal separator 14 has arisen from the inside of a tank 1 in this intake 2, the foreign matter B included in an intake 2 flows into a centrifugal separator 14 in the condition of having been mixed with water. It dissociates with water here and the foreign matters B which flowed into the centrifugal separator 14 are collected in equipment.

[0029] The water which the foreign matter B separated with the centrifugal separator 14 flows into a flush tank 16 through the communicating tube 15, and is sent to a filter 18 by the circulating pump 17 from this flush tank 16. That is, the water which the foreign matter B is not mixing passes along a circulating pump 17. Ammonia is removed here and the water supplied to the filter 18 flows into a tank 1 from the upper part through a feed pipe 19. A foreign matter B and ammonia are removable with the circulatory system mentioned above.

[0030] The organic substance contained in the water in a tank 1 is discharged out of a tank 1 through a duct 7. That is, when the organic substance is contained in the water in a tank 1, and air bubbles A arrive at the water surface in a duct 7, the bubble 21 with which the film which consists of water into which the organic substance melted forms a front face is generated on the water surface. Since it increases by adding air bubbles A from a lower part, this bubble 21 comes to fill the upper part of a duct 7 gradually, and is extruded from a tip through the level extension part of a duct 7. Thus, the organic substance is discharged out of a tank in the state of a bubble 21.

[0031] Since the amount of dissolved oxygen will increase when these air bubbles A drift underwater if air bubbles A are used in order to remove a foreign matter B and harmful matter like this culture equipment for fish, there is also an advantage that it is

not necessary to form independently the equipment with which dissolved oxygen is compensated.

[0032] In addition, as long as it is not limited in the shape of a closed-end cylinder and the bottom inclines, box-like [ of a plane view rectangle ] is sufficient as the configuration of a tank 1. In taking this configuration, it sets up the location of the gassing member 5 so that water may flow to the one where a bottom is lower by the convection current produced with a rise of air bubbles A. Namely, it is not necessary to arrange the gassing member 5 in the center of a tank 1 depending on the configuration of the bottom of a tank 1. Moreover, since a foreign matter B is removable if the convection current produces the inside of a tank 1 when air bubbles A go up, it is not necessary to form a duct 7, and even if it is the case where a duct 7 is formed, the structure which blows off air bubbles A can be changed suitably.

[0033]

[Effect of the Invention] As explained above, when blow-off \*\*\*\*\* goes up the inside of a tank from a gassing member, according to this invention, the water near the gassing member goes up with air bubbles. For this reason, the convection-current phenomenon of water occurs in a tank. Near the bottom of a tank, when this convection-current phenomenon arises, since water flows to a longitudinal direction, being pushed by water becomes a cause, as the foreign matters collected on the bottom of a tank, such as a part for the remainder of food and stools of a fish, slide on an inclined plane, they get down from it, they move to the bottom of a tank, and go into an intake.

[0034] Therefore, said foreign matter can be removed easily, without carrying out cleaning within a tank.

[0035] According to other invention which arranges a barrel above the gassing member near the intake, when the air bubbles which blew off from the inside of a barrel on the outside of a barrel through the through hole move upwards along with a barrel, the convection current of water occurs in a tank. Towards the lower part of a gassing member, i.e., the lowest part of the tank in which an intake carries out opening, when this convection current arises, water goes up along with a barrel and water flows from the side. Therefore, since the foreign matter collected on the bottom of a tank is pushed towards an intake by water, said foreign matter goes into an intake certainly.

[0036] Moreover, when air bubbles go up the inside of a barrel, the organic substance, such as mucus on the front face of a fish, becomes a bubble from the water surface in a barrel, and is discharged through a barrel. Therefore, since it can remove the organic substance using the air bubbles and barrel for generating the convection current, although the culture equipment for fish concerning this invention does so the removal effectiveness equivalent to the case where a filter is used, it is cheap.

[0037] According to other invention which forms the centrifugal separator for tailing, the foreign matter included in an intake is separated by the centrifugal separator with water, and the water which the foreign matter is not mixing flows into a circulating pump. Therefore, since the water path of a circulating pump is not narrowed with a foreign matter, the culture equipment for fish with which the capacity to circulate through water is kept constant over a long period of time can be offered.

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[Translation done.]

JAPANESE [JP,10-337131,A]

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the sectional view showing the configuration of the culture equipment for fish concerning this invention.

[Description of Notations]

1 [ -- A gassing member, 7 / -- A duct, 11 / -- A lower round hole, 12 / -- An up round hole, 14 / -- A centrifugal separator, 17 / -- Circulating pump. ] -- A tank, 1a -- A bottom wall, 2 -- An intake, 5

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[Translation done.]